IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re:	Peter J. Nicklas	Confirmation No:	9534
Serial No:	10/714,090	Group:	1725
Filed:	November 14, 2003	Examiner:	Elve, Maria Alexandra
For:	Hybrid tubular wire electrode for submerged arc welding		
Customer No.:	29127		
Attorney Docket No.	22176.25 (ITW-14378)		

APPELLANT'S BRIEF

VIA FACSIMILE: **571-273-8300**
Mail Stop Appeal Brief- Patents
Commissioner for Patents
P.O. Box 1450,
Alexandria, Virginia 22313-1450

Sir:

This is the Applicants' appeal from the final Office Action, mailed September 11, 2007 (Paper No. 20070903).

A two-month extension of time is requested for this response.

Real Party in Interest

Hobart Brothers Company, the Assignee of the present application, is the real party in interest.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of Claims

Claims 1-12 and 14-20 are pending in this application. Claims 1-9 and 14-20 are withdrawn from consideration. Claims 10-12 are rejected.

Status of Amendments

All amendments have been entered. There were no post final amendments or proposed amendments.

Summary of Claimed Subject Matter

Claim 10 is directed to a tubular weld wire, which comprises a steel sheath encapsulating a core (Paragraph [14]). The core is formulated for submerged arc welding and comprises one or more non-metallic compounds selected from the group of non-metallic compounds consisting of Al_2O_3, Na_2O_3, $MgCO_3$, MgAl, CaF_2, $CaCO_3$, MgO and combinations thereof (Paragraphs [14], [15], [16], [18]). The total percentage of one or more non-metallic compounds in the core composition ranges from about 1% Wt to about 30% Wt, wherein the non-metallic compounds are Al_2O_3 and Na_2O_3 with the total percentage of 14% Wt (Paragraphs [14], [19]).

Claim 11 is directed to the tubular weld wire of Claim 10, wherein the core composition further comprises compacted Fe, FeMg, and FeSi (Table 1, Fig. 3).

Claim 12 is directed to the tubular weld wire of Claim 10, wherein the total percentage of one or more non-metallic compounds ranges between 5% Wt and 15% Wt (Paragraph [7]).

Grounds of Rejection to be Reviewed on Appeal

I. Whether claims 10 and 12 are patentable under 35 U.S.C. 103(a) over Ogawa *et al.* (USPN 5,861,605) in view of Nemoto *et al.* (USPN 3,855,015).

II. Whether claim 11 is patentable under 35 U.S.C. 103(a) over Ogawa *et al.* and Nemoto *et al.* and further in view of Arikawa *et al.* (USPN 3,531,620).

Argument

I. With regard to Issue I on appeal, Applicant argues as follows.

Claims 10 and 12 are rejected under 35 U.S.C. 103(a) over Ogawa *et al.* (USPN 5,861,605) in view of Nemoto *et al.* (USPN 3,855,015). Applicant respectfully disagrees and presents the following arguments in support of patentability.

For an obviousness rejection to be proper, the Patent Office must meet the burden of establishing a prima facie case of obviousness. The Patent Office must meet the burden of establishing that all elements of the invention are disclosed in the cited publications, which must have a suggestion, teaching or motivation for one of ordinary skill in the art to modify a reference or combined references.[1] The cited publications should explicitly provide a reasonable expectation of success, determined from the position of one of ordinary skill in the art at the time the invention was made.[2] As argued below, this burden has not been met.

In the final Office Action the Examiner states that the Ogawa patent discloses a flux cored welding wire with a stainless steel sheath, in which "the core contains Al_2O_3, $CaCO_3$, CaF_2, MgO, Na_2O_3 and other compounds and elements". In addition, the Examiner states that the Ogawa patent discloses the flux ratio in the range from 23 to 25 wt% and combined amounts of Al_2O_3 and Na_2O_3 of about 1.5 wt%. The Examiner further admits that the Ogawa patent does not teach the claimed combined amounts of 14 Wt% of Al_2O_3 and Na_2O_3. To overcome this deficiency, the Examiner uses the Nemoto patent, which, according to the Examiner, recites submerged arc welding of a steel product with the use of a flux, in which the combined amounts of Al_2O_3 and Na_2O_3 are approximately 15.2wt%.

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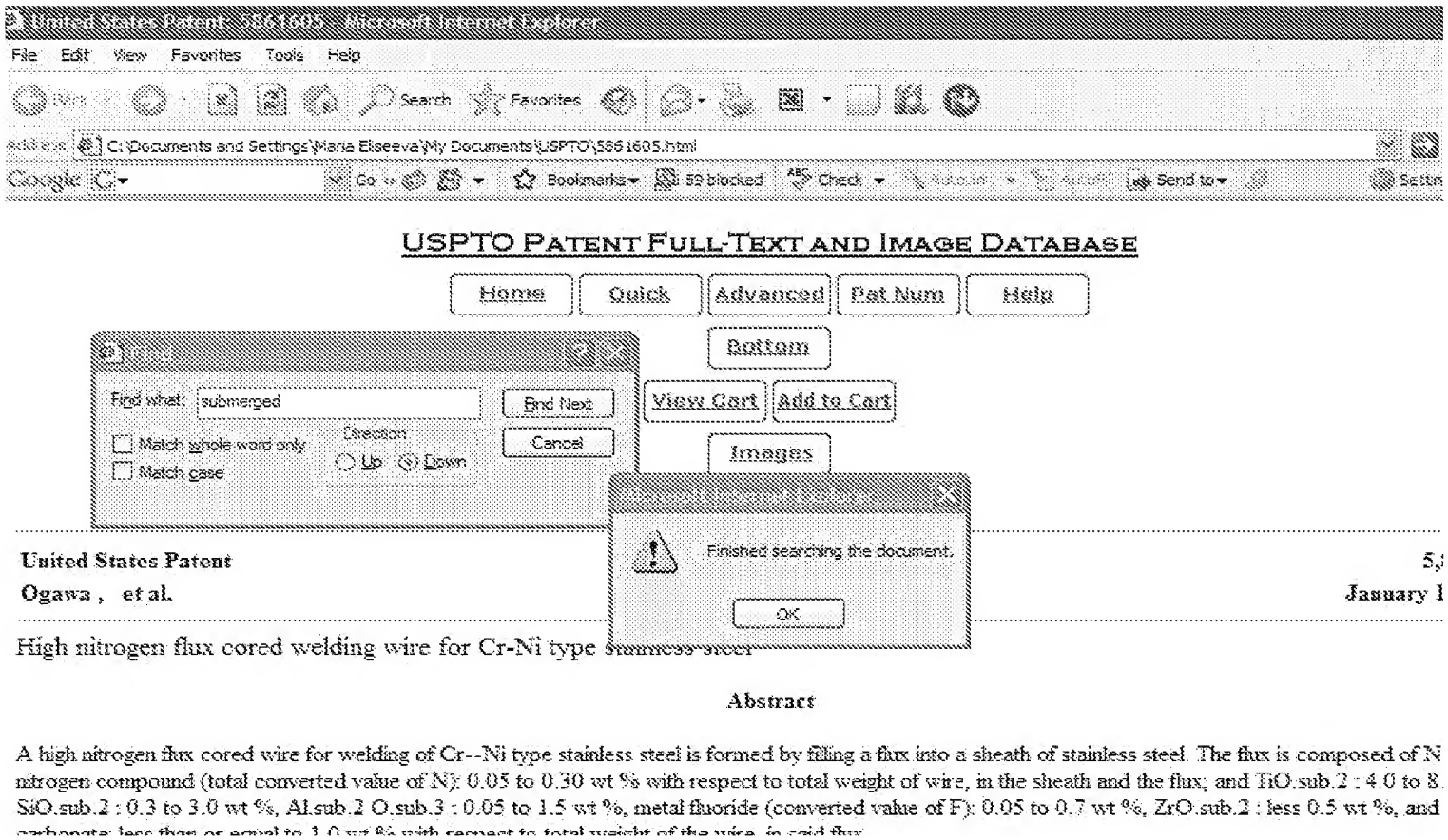
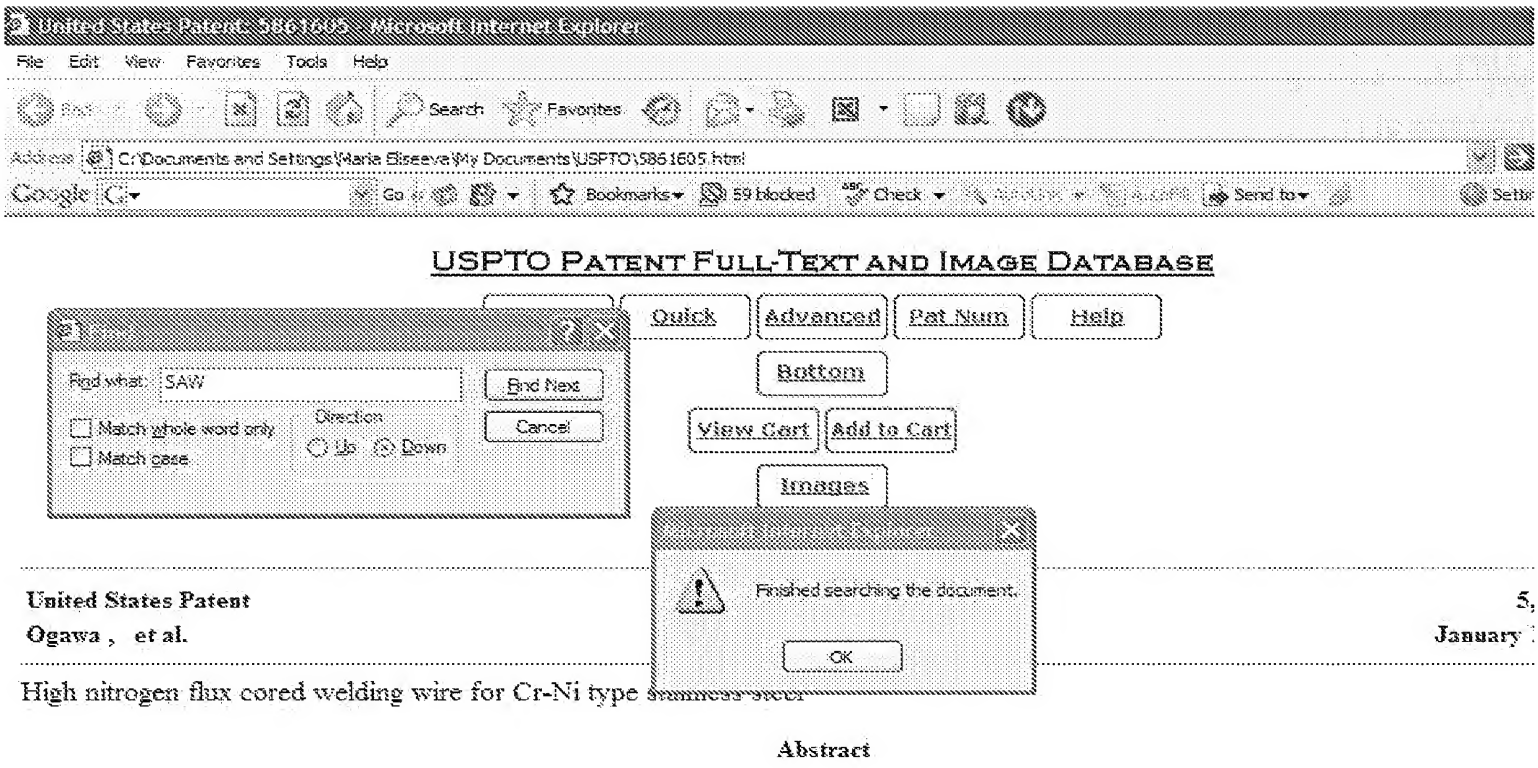
1 *In re Sang Su Lee, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002).*
2 *In re Fine, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970);*
Amgen v. Chugai Pharmaceuticals Co., 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996);

Applicant disagrees with the Examiner's reasoning and refers the attention of the Board to the Ogawa patent. Contrary to the invention claimed in Claim 10 and Claim 12, Ogawa specifically teaches a high nitrogen flux cored wire for welding of a Cr--Ni type stainless steel (see, for example: "the flux is composed of N and nitrogen compound (total converted value of N): 0.05 to 0.30 wt % with respect to total weight of wire, in the sheath and the flux") [Abstract]. It follows from the disclosure in the Ogawa patent that it does not relate even remotely to the type of submerged arc welding and the problem of designing a hybrid tubular wire electrode for that specific type of welding. For example, the undersigned attorney has searched the text of the Ogawa patent and did not find there a single mention of the words "submerged" or "SAW", which would have been there, if Ogawa had anything to do with SAW:





As the Examiner correctly pointed out, Ogawa et al. does not teach combined amounts of Al_2O_3 and Na_2O_3 of 14 wt% at all. The Examiner then cites a secondary publication - the Nemoto patent, stating that it recites submerged arc welding of a steel product with the use of a flux, in which the combined amounts of Al_2O_3 and Na_2O_3 are approximately 15.2Wt%. The Examiner further wrote that "it would have been obvious to one of ordinary skill in the art at the time of the invention to use the Al_2O_3 and Na_2O_3 as taught by Nemoto et al. in the Ogawa et al. system because they are both drawn to the submerged arc welding of similar materials." The Examiner is completely wrong in her statements and in combining the Nemoto patent with the Ogawa patent in rejecting Claim 10 for the following reasons.

1) As it has already been argued and shown above, the Ogawa patent has nothing to do with submerged arc welding, it has to do with a completely different area of welding and welding materials. To state that both patents are drawn to submerged arc welding is simply incorrect.

2) The composition of the flux of Nemoto cited by the Examiner has nothing to do with the weld wire claimed in Claim 10 of the present invention. The Nemoto patent talks about two different things. One is the solid weld wire itself, "composed of 0.59 wt% of C, 0.18 wt% of Si, 0.30 wt% of Mn, 0.008 wt% of P, 0.021 wt% of S, 5.33 wt% of Cr, 1.48 wt% of Mo, 1.10 wt% of V, 0.21 wt% of Ti and the balance of Fe" (Column 11, lines 15-21). It is clear from the quoted excerpt that the welding wire of Nemoto does not comprise any one of the compounds present in the welding wire of the subject invention as claimed in Claim 10. Moreover, the flux composition described in Nemoto and cited by the Examiner has nothing to do with the composition of the Nemoto welding wire. The Nemoto flux composition is not event contained in its weld wire, it is present in a flux which is separately provided in a typical submerged arc welding process. For example, in Col. 6, lines 55-64 Nemoto describes that:

> Two bar materials, which were individually 32 mm. in diameter and 300 mm. in length, were so arranged as shown in FIG. 3, and were combined with each other by welding the two at portions distanced by 50 mm. from both ends. Subsequently, a flux and powders of alloying elements were sprinkled over the uncombined portions and melted by application of high frequency, and the bar materials were welded with each other according to submerged arc welding using a wire which had been processed in diameter to 4 mm. (emphasis added)

There is absolutely nothing in Nemoto that could make one think or even suggest that the referenced flux composition has anything to do with the composition of the weld wire itself. Therefore, whatever those separate flux compositions are, they are irrelevant to and have nothing to do with a core composition and weight percentages of the compounds of the core of the weld wire as claimed in Claim 10. The Examiner provides no reason or support for her assertion that somehow a flux that can be sprinkled on a work piece and later used in a welding process can successfully be used in a core composition of a

tubular weld wire in a submerged arc welding process. Therefore, as already stated, the composition of the welding wire of claim 10 has nothing in common with the composition of the Nemoto solid weld wire. Similarly, the separately provided flux composition of the Nemoto patent has nothing to do with the non-metallic compounds of the core composition of the subject invention.

3) The composition of the flux described in Col. 11 lines 24-39 of the Nemoto patent reads as follows:

> As the flux was used a 4:1 mixture of **a flux** composed of 16 wt% of SiO_2, 16 wt% of Al_2O_3, 21 wt% of CaO, 31 wt% of MnO, 7 wt% of CaF_2, 4 wt% of Fe_2O_3 and 3 wt% of Na_2O_3, and **a flux** composed of 20 wt% of $CaCO_3$, 40 wt% of CaF_2, 15 wt% of Mn and 25 wt% of Fe-Ti. (emphasis added).

In essence, that excerpt says that two fluxes of the cited compositions mixed in a 4 to 1 proportion can be used as a separate flux sprinkled on two metal portions which can be later welded using a solid wire in a SAW process. It can be calculated that the resulting flux mixture contains about 15.2 wt% of the combined Al_2O_3 and Na_2O_3.

It is completely impossible to see how anyone of ordinary skill in the art at the time the invention was made could have found any suggestion or had a reason or incentive for combining the Ogawa patent describing an unrelated flux-core welding electrode having high nitrogen content for improving corrosion resistance in a weld metal, with the Nemoto disclosure of a solid metal wire not even having a core, and an unrelated to the wire separate flux mixture with combined amount of Al_2O_3 and Na_2O_3 being 15.2 wt%.

The Examiner has stated that combined amount of Al_2O_3 and Na_2O_3 being 15.2 wt% "closely approximates applicant's claimed invention." The Examiner provided no reason or explanation regarding her assertion that somehow 15.2 wt% closely approximates the total 14 wt% of Al_2O_3 and Na_2O_3 claimed in Claim 10. To the contrary,

in the field of composition of matter there is no absolutely no reason to think that simply changing a percentage in a composition of one material even slightly will lead to an approximately the same composition, or a closely approximate material. Changing even slightly a percentage of even one component can actually lead to a material with profoundly different properties. The simplest widely known example is a Fe-C alloy, where it is known as steel when the percentage of C does not exceed roughly 2%, and where it becomes cast iron if the percentage of C exceeds roughly 2%. According to the Examiner's logic, Fe-1.9%C and Fe-3.1%C would be approximately the same materials, while in reality they are very different. Therefore, since the Examiner provided no support for her assertion that somehow 15.2 wt% closely approximates the total 14 wt% of Al_2O_3 and Na_2O_3 claimed in Claim 10, the Examiner's argument is unsupported, ungrounded and must fail.

Therefore, for the reasons set forth above, Ogawa and/or Nemoto, alone or in any combination thereof, do not disclose, teach, and/or suggest each and every element of independent Claim 10, as required to make a prima facie case of obviousness under 35 U.S.C. 103(a). Moreover, given that the disclosures of Ogawa and Nemoto address widely different welding problems and widely different welding applications, the combination of these cited patents also does not explicitly provide a reasonable expectation of success, determined from the position of one of ordinary skill in the art at the time the invention was made.

Thus, independent Claim 10 is not obvious in view of any combination of Ogawa and Nemoto. Based on the above reasoning, reversal of this rejection and allowance of Claim 10 is therefore respectfully requested. Claim 12 depends directly from Claim 10. Thus for reasons set forth above for claim 10, Claim 12 should also be in condition for allowance.

II. With regard to Issue II on appeal, Applicant argues as follows.

Claim 11 is rejected under 35 U.S.C. 103(a) over Ogawa *et al.* and Nemoto *et al.* and further in view of Arikawa *et al.* (USPN 3,531,620). Applicants respectfully disagree and present the following arguments in support of patentability.

First, Claim 11 depends directly from Claim 10, which is patentable over the combination of Ogawa and Nemoto. Thus for reasons presented above in detail above regarding claim 10, Claim 11 should also be allowed.

In addition, Applicants respectfully submit that the Arikawa patent discloses a continuous and consumable electrode for automatic arc welding of steel without using shielding gas or the like. The electrode includes a steel casing and a powder divided into an outside layer and an inside core. (See, for example, Col. 5, lines 6-7 of the cited document.) The electrode includes Fe powder, as seen, e.g., at Col. 6, line 27, Col. 7, line 11, or Col. 8, line 22. At Col. 3, line 69, Arikawa et al. disclose the presence of Fe-Ti, Fe-Zr and Fe-Al. Fe-Mn and Fe-Si also are disclosed, as seen in Examples 3 and 5 of the cited document.

However, there is no disclosure or suggestion in Arikawa regarding the presence of FeMg. Nor does the Arikawa patent disclose or suggest a core such as set forth in Applicant's Claim 10 and which further includes compacted Fe, FeMg, and FeSi, as specified in instant Claim 11.

Therefore, the Arikawa patent does not remedy the deficiencies of the combination of Ogawa and Nemoto patents. Thus, the combination of the Ogawa, Nemoto and Arikawa patents cited in the Office Action does not disclose each every element of Claim 11, as required to make a prima facie case of obviousness under 35 U.S.C. 103(a). Furthermore, one of ordinary skill in the art, at the time the invention was made, would have found no motivation to combine the teachings of Ogawa and Nemoto with those of Arikawa, as stated in the Office Action.

For instance, the Ogawa patent discloses a flux cored wire suitable for welding under gas shielding, as seen at Col. 5, lines 22-24 of the document. One of ordinary skill in the art, at the time the invention was made, would have had no reason or incentive to combine its disclosure with those of Nemoto directed to welding a solid metal wire around a body of a work roll for use in hot rolling of steel, and/or with the disclosure of Arikawa, which are directed to a yet different welding process with an arc welding electrode for use in the absence of a shielding gas. Nor would one of ordinary skill in the art had found any suggestion or had a reason or incentive for combining the Ogawa patent teaching a flux cored welding electrode having high nitrogen content for improving corrosion resistance, with Nemoto investigating the best metal content in the solid wire with no core at all, and/or with Arikawa, which is concerned with the negative effects of nitrogen and recommending denitrodizing agents, as seen, for instance, at Col. 3, lines 50-75 of that patent, to come up with the invention as claimed in Claim 11 of the present application.

For the foregoing reasons, Applicant believes that the pending rejections under 35 U.S.C. 103(a) of Claims 10-12 should be reversed, and that the referenced Claims should be allowed.

Respectfully submitted,

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Claims Appendix

1. (Withdrawn) A welding apparatus for a submerged arc welding process comprising: a welding gun having means for feeding a tubular electrode into the welding gun; and the tubular electrode formulated for use in the submerged arc welding process and having a sheath encapsulating a core with a composition selected from the group of non-metallic compounds consisting of Al_2O_3, Na_2O_3, $MgCO_3$, MgAl, CaF_2, $CaCO_3$, CaF_2, MgO and combinations thereof, wherein the total percentage of one or more non-metallic compounds in the core composition ranges from about 1% Wt to about 30% Wt.

2. (Withdrawn) The welding apparatus as in claim 1, wherein the total percentage of one or more non-metallic compounds ranges between 5% Wt and 15% Wt.

3. (Withdrawn) The welding apparatus of claim 1, wherein the non-metallic compounds are Al_2O_3 and Na_2O_3 with the total percentage of 14% Wt.

4. (Withdrawn) The welding apparatus of claim 1, wherein the means for feeding the tubular electrode into the welding gun comprise a wire drive and a wire reel.

5. (Withdrawn) A submerged arc welding process comprising: providing a submerged arc welding apparatus with means for feeding an tubular electrode into the welding apparatus; depositing a flux onto a work piece; submerging the tubular electrode into the flux; forming an arc between the tubular electrode and the work piece by coupling the submerged arc welding apparatus to a power source; feeding the tubular electrode into the welding apparatus, the tubular electrode having a sheath encapsulating a core with a composition selected from the group of non-metallic compounds consisting of Al_2O_3, Na_2O_3, $MgCO_3$, MgAl, CaF_2, $CaCO_3$, CaF_2, MgO and combinations thereof, wherein the total percentage

of one or more non-metallic compounds in the core composition ranges from about 1% Wt to about 30% Wt; and forming a weld on the work piece by melting the work piece, the flux and the tip of the tubular electrode using the heat generated by the arc.

6. (Withdrawn) The method of claim 5, further comprising moving the welding apparatus along the work piece.

7. (Withdrawn) The method of claim 5, wherein the work piece is a carbon steel.

8. (Withdrawn) The method of claim 5, wherein the total percentage of one or more non-metallic compounds ranges between 5% Wt and 15% Wt.

9. (Withdrawn) The method of claim 5, wherein the non-metallic compounds are Al_2O_3 and Na_2O_3 with the total percentage of 14% Wt.

10. (Previously presented) A tubular weld wire comprising: a steel sheath encapsulating a core; the core formulated for submerged arc welding and comprising one or more non-metallic compounds selected from the group of non-metallic compounds consisting of Al_2O_3, Na_2O_3, $MgCO_3$, MgAl, CaF_2, $CaCO_3$, MgO and combinations thereof, wherein the total percentage of one or more non-metallic compounds in the core composition ranges from about 1% Wt to about 30% Wt and wherein the non-metallic compounds are Al_2O_3 and Na_2O_3 with the total percentage of 14% Wt.

11. (Original) The tubular weld wire of claim 10, wherein the core composition further comprises compacted Fe, FeMg, and FeSi.

12. (Original) The tubular weld wire of claim 10, wherein the total percentage of one or more non-metallic compounds ranges between 5% Wt and 15% Wt.

13. (Canceled)

14. (Withdrawn) A welding apparatus for a submerged arc welding process comprising: a welding gun having means for feeding a tubular electrode into the welding gun; and the tubular electrode formulated for welding low carbon steels with a percentage of C being up to 0.15% in the submerged arc welding process and having a sheath encapsulating a core with a composition selected from the group of non-metallic compounds consisting of Al_2O_3, Na_2O_3, $MgCO_3$, MgAl, CaF_2, $CaCO_3$, CaF_2, MgO and combinations thereof, wherein the total percentage of one or more non-metallic compounds in the core composition ranges from about 1% Wt to about 30% Wt.

15. (Withdrawn) The welding apparatus of claim 14, wherein the tubular electrode is also formulated for welding low alloy steels with a percentage of C being up to 0.15% in the submerged arc welding process.

16. (Withdrawn) The welding apparatus of claim 14, wherein the total percentage of one or more non-metallic compounds ranges between 5% Wt and 15% Wt.

17. (Withdrawn) The welding apparatus of claim 15, wherein the total percentage of one or more non-metallic compounds ranges between 5% Wt and 15% Wt.

18. (Withdrawn) A submerged arc welding process comprising: providing a submerged arc welding apparatus with means for feeding an tubular electrode into the welding apparatus; depositing a flux onto a work piece of low carbon steel or low alloy steel with a percentage of C being up to 0.15%; submerging the tubular electrode into the flux; forming an arc between the tubular electrode and the work piece by coupling the submerged arc welding apparatus to a power source; feeding the tubular electrode into the welding apparatus, the tubular electrode

having a sheath encapsulating a core with a composition selected from the group of non-metallic compounds consisting of Al_2O_3, Na_2O_3, $MgCO_3$, MgAl, CaF_2, $CaCO_3$, CaF_2, MgO and combinations thereof, wherein the total percentage of one or more non-metallic compounds in the core composition ranges from about 1% Wt to about 30% Wt; and forming a weld on the work piece by melting the work piece, the flux and the tip of the tubular electrode using the heat generated by the arc.

19. (Withdrawn) The method of claim 18, wherein the total percentage of one or more non-metallic compounds ranges between 5% Wt and 15% Wt.

20. (Withdrawn) The method of claim 18, wherein the non-metallic compounds are and Na_2O_3 with the total percentage of 14% Wt.

Evidence Appendix

None

Related Proceedings Appendix

None